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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,697	02/25/2004	Mathew T. Abraham	010886.00633	3661

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EXAMINER

SELLERS, DANIEL R

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/786,697	ABRAHAM, MATHEW T.	
	Examiner	Art Unit	
	Daniel R. Sellers	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 13-17 and 22 are objected to because of the following informalities: The numbering of the individual features is inconsistent with the parent claim 12.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1-11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Miller et al. (Miller), U.S. Patent No. 5,506,910.
3. Regarding claim 1, Miller teaches a first channel element and a second channel element with a communication pathway in a multi-channel acoustic system (Col. 7, lines 9-19, lines 33-36, lines 42-47, and lines 52-57 and Fig. 5, units 20a, 20b, 40a, and 40b).
4. Regarding claim 2, the further limitation of claim 1, see the above arguments. Miller teaches a feedback suppression system for one channel, and further teaches that the same system can be used for a plurality of channels. Therefore the first and the second elements are functionally identical.
5. Regarding claim 3, the further limitation of claim 1, see the above arguments with respect to claim 1. Miller teaches the acoustic system of claim 1, and further teaches

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the use of digital signal processing techniques for creating the notch filter (Col. 5, lines 63-67). Miller also teaches that the multiband gain control unit is **any device** that can be automatically controlled to vary the gain of a selected audio band, and Miller teaches in one embodiment that the bands are $\frac{1}{2}$ to 1 octave wide spaced $\frac{1}{3}$ an octave apart (Col. 4, lines 21-46). These widths cover 6 to 12 semitones and are spaced every 4 semitones in a western musical scale, and typical notch filters are usually a few to several semitones wide. The fact that Miller teaches that the multiband control unit can be any device that would have these desirable features, it is inherent that the multiband control unit can be 31 notch filters, which would be automatically controlled.

6. Regarding claim 4, the further limitation of claim 3, see the above arguments of claims 1, 2, and 3. Miller teaches a system with functionally identical feedback suppression elements. The second element has all the functionality of the first element, therefore Miller teaches a second channel element with these features.

7. Regarding claim 5, the further limitation of claim 4, see the above arguments with respect to claim 4. Miller teaches a communication system which passes parameters between the elements.

8. Regarding claim 6, the further limitation of claim 1, see the above arguments with respect to claim 5. Miller teaches the separate elements working synchronously, and therefore one element passes parameters to the other through the communication means.

9. Regarding claim 7, the further limitation of claim 1, see claim 1. Miller teaches a multi-channel feedback suppression system.

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10. Regarding claim 8, the further limitation of claim 4, see the above rejection of claims 1 and 4. Miller teaches a multi-channel feedback suppression system.
11. Regarding claim 9, the further limitation of claim 8, see the above rejection of claims 8. Miller teaches a plurality of channel elements and teaches a communication pathway linking the plurality of channel elements (Col. 7, lines 52-57).
12. Regarding claim 10, the further limitation of claim 8, see the above rejection of claim 8. Miller teaches that the different elements both choose to communicate with each other or choose not to communicate with each other (Col. 7, lines 42-47).
13. Regarding claim 11, the further limitation of claim 3, see the above rejection of claim 3. Miller teaches a control module (Col. 7, lines 20-24).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claim 12-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller and Jaeger et al. (Jaeger), U.S. Patent No. 4,177,356.
16. Regarding claim 12, see the above argument with respect to claim 1. Miller teaches an automatic equalizer. Miller teaches the steps of detecting feedback, determining filter parameters and adjusting the element to ameliorate the feedback.

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However, Miller does not explicitly state that an indicator is sent through the communication channel, but it is obvious that an indicator must be sent for the step of arbitration or synchronization (Col. 7, lines 55-57). Miller also does not teach that any filter parameters are sent to the second element. Jaeger teaches a signal enhancement system for audio signals. Jaeger does not teach a feedback suppression system. Jaeger teaches identical expander circuitry in both channels and a system, which provides the same amount of gain to expander circuits in both the left and right channels of a stereo signal. The amount of gain is shared across the channels in its respective frequency band to preserve the stereo image (Col. 9, lines 53-58). It would have been obvious for one of ordinary skill in the art to combine the teachings of Miller with those of Jaeger for the purpose of high fidelity. The coefficients of an adaptive filter in one channel should be used in the other channel to preserve the stereo image.

17. Regarding claim 13, the further limitation of claim 12, see the preceding argument regarding claim 12. The combination of Miller and Jaeger teach this.

18. Regarding claim 14, the further limitation of claim 13, see the preceding arguments of claims 2 and 13. Miller teaches a plurality of channels with identical feedback suppression means, and the combination of Miller and Jaeger teach the features of claim 13.

19. Regarding claim 15, the further limitation of claim 14, see the above argument with respect to claim 12. The combination of Miller and Jaeger teach the sending of an indicator.

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20. Regarding claim 16, the further limitation of claim 14, see the above argument with respect to claim 12. The combination of Miller and Jaeger teach the sending of filter parameters to preserve the stereo image.

21. Regarding claim 17, the further limitation of claim 14, see the preceding arguments with respect to claim 15 and 16. The combination teaches these features.

22. Regarding claim 18, the further limitation of claim 12, see the preceding argument of claim 12. Miller teaches a feedback suppression system, which selects frequency and depth (Col. 4, lines 32-40).

23. Regarding claim 19, the further limitation of claim 18, see the preceding argument with respect to claims 12 and 18. Miller teaches the use of a DSP to implement filters. It would be obvious to program the DSP to increment the depth variable to ameliorate feedback. In the art of adaptive filters, coefficients are adaptively adjusted in increments with reference to an error or distortion signal.

24. Regarding claim 20, the further limitation of claim 19, see the preceding argument with respect to claim 19. In the art of adaptive filters, the coefficients are adjusted until a predetermined result is obtained.

25. Regarding claim 21, the further limitation of claim 19, see the preceding argument with respect to claim 20. Miller teaches a feedback suppression system, so it is inherent that the depth of a notch filter is increased until the feedback is suppressed.

26. Regarding claim 22, the further limitation of claim 12, see the preceding argument with respect to claim 12. Miller teaches an automatic equalizer, which creates a reference signal to be played back through the system for the purpose of calibration.

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Miller further teaches that the incoming signal, mixed with the reference signal, is monitored in an appropriate time window to determine if the reference signal caused any acoustic feedback. Miller teaches that the system takes corrective action when acoustic feedback is detected (Col. 6, lines 51-61).

27. Regarding claim 23, the further limitation of claim 12, Miller teaches a system using a DSP. The DSP is a processor, and inherently has its instructions stored on a computer-readable medium.

28. Regarding claim 24, the further limitation of claim 13, Miller teaches a system using a DSP.

29. Regarding claim 25, the further limitation of claim 13, Miller teaches a system using a DSP.

30. Regarding new claim 26, see the preceding argument with respect to claims 1 and 12. The combination of Miller and Jaeger teaches the features of adaptive notch filtering in two different feedback paths.

Response to Arguments

31. Applicant's arguments filed November 21, 2005 have been fully considered but they are not persuasive. Miller does teach that the microphones used in automatic equalization are used in the audience section during a performance, however the claim language "performance microphone" is not limiting to an example such as an on-stage microphone as suggested by the specification. The office interprets a "performance

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microphone” as a microphone that is used during a performance, but does not equate the limitation as a spatial requirement on placement of a microphone

Conclusion

32. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Berkhout, U.S. Pat. No. 5,142,586, teaches acoustic feedback reduction on stage (Col. 5, line 1 – Col. 6, line 15); and

Todter et al., U.S. Pat. No. 5,937,070, teaches a noise canceling system with a plurality of microphones and notch filters (Col 4, line 13 – Col. 5, line 25 and Fig. 7 and 11-13).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel R. Sellers whose telephone number is 571-272-7528. The examiner can normally be reached on Monday to Friday, 9am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DRS



HUYEN LE
PRIMARY EXAMINER